

Diversity of pimpline wasps (Hymenoptera: Ichneumonidae) in the Central highlands of Vietnam

Đa dạng các loài ong cự phân họ Pimplinae (Hymenoptera: Ichneumonidae) ở khu vực Tây Nguyên

Short communication

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In this paper, 48 ichneumonid species of 14 genera, two tribes of the subfamily Pimplinae were listed on the basis of material collected during the time from 2003 to 2011 in four provinces from the Central Highlands of Vietnam and a lesser degree of previous records. Among 48 aforementioned pimpline no less than 16 species were described recently as new for science. The diversity of topography and vegetation types resulted in the high level of species richness and new discoveries of the region.

Bài báo này giới thiệu danh sách 48 loài ong cự thuộc 14 giống, 2 tộc của phân họ Pimplinae dựa trên việc phân tích các mẫu vật thu tại Tây Nguyên trong thời gian từ năm 2003–2011 và một số ít loài dựa trên các ghi nhận trước đây. Trong số đó, 16 loài mới được mô tả trong thời gian 5 năm trở lại đây. Sự đa dạng về địa hình và các kiểu thảm thực vật khác nhau đã tạo nên tính đa dạng thành phần loài và các phát hiện mới của ong cự ở khu vực Tây Nguyên đầy tiềm năng này.

Keywords: ichneumonid, parasitoid, diversity

1. Introduction

Located in the south of Truong Son Range, Central Highlands of Vietnam is recognized as one of centers of biodiversity of the country. The complex topography of the area with many plateaus over 1,000 m above level sea (Play Ku, Dak Lak, Da Lat, Chu Yang Sin and Di Linh Plateaus) and divided by several large rivers (Se San River, Ba River, Sere Pok River) has given a wide variety of vegetation types and microclimate conditions. Therefore, this region is home to a high level of biodiversity and may be a focal point or hotspot of endemism within mainland Southeast Asia (Sterling et al., 2006).

Pimplinae is a moderately large group of Ichneumonidae (Hymenoptera) comprising more than 1500 species classified in 77 genera. The members of this subfamily are either idiobiont endoparasitoids of Lepidoptera; idiobiont ectoparasitoids of xylophagous Coleoptera larvae or koinobiont ectoparasitoids of spiders. As a consequence, it is one of the most extensively studied ichneumonid taxa, both from a taxonomic perspective and from a biological

one (Gauld et al., 2002; Yu et al., 2005; Gauld & Dubois, 2006; Palacio et al., 2007; Pham, 2013).

In Vietnam, Pimplinae has been investigated more comprehensively with a total of 122 species recorded in 21 genera (Pham, 2013). In this paper, the author would like to summarize the diversity of Pimplinae from the Central Highlands of Vietnam and emphasize the potential of biological resources of the region.

2. Materials and methods

Taxonomic decision in this paper was based on material collected from 2003 to 2011 in Kon Tum, Gia Lai, Dak Lak and Lam Dong provinces and a lesser degree on previous records of foreign authors.

Abbreviations of some museums where the types are being deposited as below:

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AEIC	USA, Florida, Gainesville, American Entomological Institute
BMNH	UK, London, Natural History Museum
BPBM	USA, Hawaii, Honolulu, Bernice P. Bishop Museum
CNC	Canada, Ontario, Ottawa, Canadian National Collection of Insects
GPTA	India, Delhi, Delhi University, Department of Zoology, Gupta Collection
HNHM	Hungary, Budapest, Hungarian Natural History Museum
IEBR	Vietnam, Hanoi, Institute of Ecology and Biological Resources
OUMNH	United Kingdom, Oxford, University Museum of Natural History
TARI	Taiwan, Taichung, Taiwan Agricultural Research Institute
USNM	USA, Washington D.C., National Museum of Natural History
ZFMK	Germany, Bonn, Zoological Research Museum Alexander Koenig
ZMHB	Germany, Berlin, Museum für Naturkunde der Humboldt-Universität
ZMUC	Denmark, Copenhagen, University of Copenhagen, Zoological Museum



Figure 1. Evergreen forests of Chu Mom Ray NP in Kon Tum Province (left) and Chu Yang Sin NP in Dak Lak Province (right). Photographs by T. N. Vu and T. V. Hoang

3. Results

A total of 48 species of 14 genera, two tribe of the sub-family Pimplinae were recorded from the Central Highlands of Vietnam. Of which, 16 species were described as new for science on the basis of material collected from this region. In addition, the unique male specimen of the genus *Pimpla* will be described in near future. Among the region, Chu Yang Sin NP is a valuable part of the network of protected areas in Vietnam with 10 newly discovered pimpline species, only lesser than Hoang Lien NP in the Northwest (12 new species). Beside the newly described species, five other species have been documented from the country but restricted only in the Central Highlands area (Pham, 2013). Resulted from many newly recently described and recorded species, the species composition of Pimplinae in the Central Highlands is quite different to those of other geographical regions. In compared with other geographic regions of Vietnam, the species richness of Pimplinae is similar to the North Central of Vietnam and only less than the northwestern region but the species composition is relatively different.

PIMPLINAE Wesmael, 1845

Tribe Ephialtini

The *Camptotypus* genus-group

Camptotypus Kriechbaumer, 1889

Camptotypus Kriechbaumer, 1889: 311. Type-species:

Camptotypus sellatus Kriechbaumer, by subsequent designation, Viereck, 1914: 27.

Camptotypus trui PHAM, BROAD & WÄGELE, 2012

Camptotypus trui Pham, Broad & Wägele, 2012. Dtsch. Entomol. Z. 59 (1): 134. Holotype: ♀, Vietnam: Kon Tum, Chu Mom Ray NP (IEBR).

Distribution: Vietnam (Kon Tum and Nghe An) (Pham et al., 2012b).

The *Sericopimpla* genus group

Acrodactyla Haliday, 1838

Barypus Haliday in Curtis, 1837: 37. Type-species: *Barypus degener* Haliday by subsequent designation (Westwood, 1840). Junior homonym of *Barypus* Laporte, 1835.

Acrodactyla Haliday, 1838: 117. Replacement name for *Barypus* Haliday.

Acrodactyla lachryma PHAM, BROAD, MATSUMOTO & BÖHME, 2012

Acrodactyla lachryma Pham, Broad, Matsumoto & Böhme, 2012. Zootaxa, 3207: 6. Holotype: ♀, Vietnam: Kon Tum, Chu Mom Ray NP (RMNH).

Distribution: Vietnam (Kon Tum) (Pham et al., 2012a).

Acropimpla Townes, 1960

Selenaspis Roman, 1910: 191. Name preoccupied by Bleeker, 1858 and by Leonardi, 1898. Type: *Hemipimpla alboscuteellaris* Szepligeti; original designation.

Acropimpla Townes, 1960: 159. Type species: *Chari-topimpla leucostoma* Cameron; original designation.

***Acropimpla lampei* PHAM, BROAD & WÄGELE, 2011**

Acropimpla lampei Pham, Broad, Wägele, 2011. Zootaxa, 2921: 6. Holotype: ♀ (IEBR), Dak Lak, Ea So NR. Distribution: Vietnam (Dak Lak) (Pham et al., 2011d).

***Acropimpla leucostoma* (CAMERON, 1907)**

Charitopimpla leucostoma Cameron, 1907. Tijdschr. Ent., 50: 97. Holotype: ♀, India: Sikkim (BMNH).
Acropimpla leucostoma: Townes & Townes (1960).
Distribution: Vietnam (Vinh Phuc, Lai Chau, Phu Tho, Hoa Binh, Ninh Binh, Ha Tinh, Thua Thien-Hue, Kon Tum, Dak Lak and Dong Nai), China, India, Indonesia, Japan, Laos, Myanmar and Sri Lanka (Yu et al., 2005; Pham, 2013).

Chablisea Gauld & Dubois, 2006

Chablisea Gauld & Dubois, 2006: 544. Type-species: *Chablisea imbiba*, by original designation.

***Chablisea khuatdanglongi* PHAM, BROAD, MATSOMOTO & WÄGELE, 2011**

Chablisea khuatdanglongi Pham, Broad, Matsomoto & Wägele, 2011. Biologia 66/6: 1136. Holotype: ♀, Vietnam: Hanoi, Thach That, Tan Xa (IEBR).
Distribution: Vietnam (Hanoi, Hoa Binh, Ninh Binh, Kon Tum and Dak Lak provinces) (Pham et al., 2011b).

Sericopimpla Kriechbaumer, 1895

Sericopimpla Kriechbaumer, 1895: 135. Type-species: *Pimpla sericata* Kriechbaumer, 1895, by monotypy.

***Sericopimpla sagrae* (VOLLENHOVEN, 1879)**

Pimpla sagrae Vollenhoven, 1879. Stettin. Ent. Ztg., 40: 149. Lectotype: ♀, Indonesia: Java (RMNH).
Sericopimpla sagrae: Townes, Townes & Gupta (1961).
Distribution: Vietnam (Thai Nguyen, Phu Tho, Ha Noi, Hoa Binh, Nghe An, Ha Tinh, Thua Thien-Hue, Dak Lak, Dong Nai), China, India, Indonesia, Malaysia, Philippines, Sri Lanka, Taiwan, Japan, and Korea (Yu et al., 2005; Pham et al., 2011e).

Zaglyptus Foerster, 1869

Zaglyptus Foerster, 1869. Verh. Naturh. Ver. Rheinlande 25: 166. Type-species: *Polysphincta varipes* Gravenhorst, by subsequent designation, Woldstedt, 1877: 17.

***Zaglyptus guptai* PHAM, BROAD & WÄGELE, 2013**

Zaglyptus guptai Pham, Broad & Wägele, 2013. Zootaxa, 3702 (5): 486. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).
Distribution: Vietnam (Dak Lak) (Pham et al., 2013c).

***Zaglyptus nigrolineatus* GUPTA, 1961**

Zaglyptus nigrolineatus Gupta, 1961.
Lissopimpla Kriechbaumer, 1889: 309. Type-species: *Lissopimpla octoguttata* Kriechbaumer, 1899 (= *Pimpla excelsa* Costa), by subsequent designation, Ashmead, 1900: 55.
Distribution: Vietnam (Dak Lak Province), India (Yu et al., 2005; Pham et al., 2013c).

Tribe Pimplini

The *Pimpla* genus-group

Echthromorpha Holmgren, 1868

Echthromorpha Holmgren, 1868: 406. Type-species: *Echthromorpha maculipennis* Holmgren, 1868.

***Echthromorpha agrestoria* (SWEDERUS, 1787)**

Ichneumon agrestorius Swederus, 1787. Kongliga Svenska Vetenskapsakademiens Handlingar. 8: 279. Holotype: ♀, Tahiti (BMNH).
Distribution: Vietnam (Ha Giang, Son La, Thai Nguyen, Vinh Phuc, Hanoi, Phu Tho, Hoa Binh, Ninh Binh, Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Thua Thien-Hue, Da Nang, Kon Tum and Dong Nai provinces), Australia, Bangladesh, Cameroon, China, Democratic Republic of Congo, Egypt, Ethiopia, Fiji, Guam, Guinea, India, Indonesia, Japan, Kenya, Laos, Liberia, Madagascar, Malaysia, Mauritius, Mozambique, Myanmar, New Caledonia, Palau, Papua New Guinea, the Philippines, Réunion, Senegal, Sierra Leone, Singapore, Society Islands, South Africa, Sri Lanka, Sudan, Tanzania, Thailand, Togo, U.S.A, Uganda, Vanuatu, Zimbabwe (Yu et al., 2005; Pham, 2013).

Lissopimpla Kriechbaumer, 1889

Lissopimpla Kriechbaumer, 1889: 309. Type-species: *Lissopimpla octoguttata* Kriechbaumer, 1899 (= *Pimpla excelsa* Costa), by subsequent designation, Ashmead, 1900: 55.

***Lissopimpla basalis* (VOLLENHOVEN, 1879)**

Pimpla basalis Vollenhoven, 1879. Stettin. Ent. Ztg. 40 (4-6): 148. Holotype: ♂, Indonesia: Sumatra (RMNH).
Lissopimpla basalis: Townes, Townes & Gupta (1961).
Distribution: Vietnam (Hoa Binh, Ninh Binh, Nghe An, Ha Tinh, Thua Thien-Hue, Quang Nam, Dak Lak), Indonesia and the Philippines (Yu et al., 2005; Pham, 2013).

Pimpla Fabricius, 1804

Pimpla Fabricius, 1804: 112. Type-species: *Ichneumon instigator* Fabricius (= *Ichneumon hypochondriaca* Retzius), by subsequent designation (Opinion 159, International Commission on Zoological Nomenclature, 1954: 282).

***Pimpla chuyangsinensis* PHAM, BROAD, DANG & BÖHME, 2013**

Pimpla chuyangsinensis Pham, Broad, Dang & Böhme, 2013. Org. Divers. Evol. 13(3): 401. Holotype: ♂, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).
Distribution. Vietnam (Dak Lak) (Pham et al., 2013a).

***Pimpla flavipalpis* CAMERON, 1899**

Pimpla flavipalpis Cameron, 1899. Mem. & Proc. Manchester Lit. Phil. Soc., 43 (3): 174. Lectotype: ♀, India: Meghalaya: Khasi Hill (BMNH).
Distribution: Vietnam (Lao Cai, Kon Tum), China, India, Myanmar, Nepal and Taiwan (Yu et al., 2005; Pham et al. 2013a).

***Pimpla* sp.**

Remarks: One male specimen collected in Bidoup Nui Ba National Park, Lam Dong Province in 2005 may reveal a new species. It will be critically examined in near future.

Xanthopimpla Saussure, 1892

Xanthopimpla Saussure 1892: 13. Type-species: *Xanthopimpla hova* Saussure, by subsequent designation, Ashmead, 1900: 56.

***Xanthopimpla alternans* KRIEGER, 1914**

Xanthopimpla alternans Krieger, 1914. Arch. f. Naturgesch., (A) 80 (6): 31. Holotype: ♀, Taiwan: Chiayi (ZMHB).

Distribution: Vietnam (Nghe An, Nha Trang, Gia Lai), China, India, Indonesia, Malaysia, Sri Lanka and Taiwan (Yu et al., 2005; Pham, 2013).

***Xanthopimpla atriclunis* TOWNES & CHIU, 1970**

Xanthopimpla atriclunis Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 157. Holotype: ♀, the Philippines: Alcate, Victoria, Mindoro Oriental (AEIC).

Distribution: Vietnam (Thua Thien-Hue, Dak Lak and Dong Nai provinces), and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla boehmei* PHAM, BROAD, MATSUMOTO & WÄGELE, 2011**

Xanthopimpla boehmei Pham, Broad, Matsumoto & Wägele, 2011. Zootaxa, 3056: 41. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (IEBR).

Distribution: Vietnam (Dak Lak) (Pham et al., 2011c).

***Xanthopimpla calva* TOWNES & CHIU, 1970**

Xanthopimpla calva Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 240. Holotype: ♀, the Philippines: Gapan, Nueva Ecija (AEIC).

Distribution: Vietnam (Nghe An, Dak Lak), India, Malaysia, Myanmar Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla chiuuae* PHAM, BROAD, MATSUMOTO & WÄGELE, 2011**

Xanthopimpla chiuuae Pham, Broad, Matsumoto & Wägele, 2011. Zootaxa, 3056: 22. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).

Distribution: Vietnam (Dak Lak) (Pham et al., 2011c).

***Xanthopimpla clivulus* TOWNES & CHIU, 1970**

Xanthopimpla clivulus Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 160. Holotype: ♀, Indonesia: Java (AEIC).

Distribution: Vietnam (Thai Nguyen, Vinh Phuc, and Dak Lak), India, Indonesia, Malaysia and Singapore (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla curvimaculata* (CAMERON, 1899)**

Pimpla curvimaculata Cameron, 1899. Mem. & Proc. Manchester Lit. Phil. Soc. 43 (3): 158. Holotype: ♂, India: Khasi Hills in Assam (OUMNH).

Xanthopimpla curvimaculata: Krieger (1914).

Distribution: Vietnam (Phu Tho, Dak Lak and Dong Nai), India, Malaysia and Thailand (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla elegans* (VOLLENHOVEN, 1879)**

Pimpla elegans Vollenhoven, 1879. Stettin. Ent. Ztg. 40: 147. Holotype: ♀, Indonesia: Java (RMNH).

Xanthopimpla elegans: Krieger (1914).

Distribution: Vietnam (Phu Tho, Ninh Binh, Nghe An, Ha Tinh, Quang Tri, Thua Thien-Hue, Kon Tum, Dak Lak, Lam Dong, Dong Nai), India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Singapore, Sri Lanka, Taiwan, Thailand and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla fastigiata* KRIEGER, 1914**

Xanthopimpla fastigiata Krieger, 1914. Arch. f. Naturgesch., (A) 80 (6): 30. Holotype: ♂, Indonesia: Sumatra, Sarik (ZMHB).

Distribution: Vietnam (Phu Tho, Hanoi, Thua Thien-Hue and Dak Lak), India, Indonesia, Malaysia, Singapore, Thailand and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla hienae* PHAM, BROAD, MATSUMOTO & WÄGELE, 2011**

Xanthopimpla hienae Pham, Broad, Matsumoto & Wägele, 2011. Zootaxa, 3056: 35. Holotype: ♀, Vietnam: Dak Lak, Ea So NR (IEBR).

Distribution: Vietnam (Dak Lak) (Pham et al., 2011c).

***Xanthopimpla jacobsoni* KRIEGER, 1914**

Xanthopimpla jacobsoni Krieger, 1914. Arch. f. Naturgesch. (A) 80 (6): 32. Holotype: ♀, Java: Semarang (HNHM).

Distribution: Vietnam (Dak Lak), Indonesia, Malaysia, New Guinea, Singapore, Sri Lanka, Thailand and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla naenia* MORLEY, 1913**

Xanthopimpla naenia Morley, 1913. Faun. British India, Hymenoptera, 3(1): 115. Holotype: ♀, India (OUMNH).

Distribution: Vietnam (Lam Dong), India, Malaysia, Japan, Taiwan and the Philippines (Townes & Chiu, 1970; Yu et al., 2005).

***Xanthopimpla nana* SCHULZ, 1906**

Xanthopimpla parva Cameron, 1905. Spolia Zeylanica 3: 136. Holotype: ♂, Sri Lanka: Peradeniya (BMNH). Junior homonym of *Xanthopimpla parva* Krieger, 1899.

Xanthopimpla nana Schulz, 1906. Spolia Hymenopterologica: 114. Replacement name.

Distribution: Vietnam (Thai Nguyen, Phu Tho, Hanoi, Hoa Binh, Ninh Binh, Nghe An, Lam Dong, Khanh Hoa and Dong Nai), Cambodia, China, India, Indonesia, Nepal, Sri Lanka, Taiwan, Thailand and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla nigratarsis* CAMERON, 1903**

Xanthopimpla nigratarsis Cameron, 1903. Jour. Straits Branch Roy. Asiatic Soc. 39: 138. Lectotype: ♀, Malaysia: Sarawak, Kuching (BMNH).

Distribution. Vietnam (Nghe An, Kon Tum and Dong Nai), India, Indonesia, Malaysia and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla ochracea* (SMITH, 1858)**

Pimpla ochracea Smith, 1858. Jour. Proc. Linn. Soc. London Zool., 4: 172. Holotype: ♀, Indonesia: Molucca Island, Aru (OUMNH).

Xanthopimpla ochracea: Krieger (1899).

Distribution: Vietnam (Lai Chau, Ninh Binh, Phu Tho and Dak Lak), Australia, China, India, Indonesia, Myanmar, Papua New Guinea, Taiwan, Thailand, and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla pulvinaris* TOWNES & CHIU, 1970**

Xanthopimpla pulvinaris Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 271. Holotype: ♀, Taiwan: Shinchu (TARI).
Distribution: Vietnam (Phu Tho, Dak Lak), China, Laos, Malaysia, Taiwan and Thailand (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla pseudosternata* PHAM, BROAD, MATSUMOTO & WÄGELE, 2011**

Xanthopimpla pseudosternata Pham, Broad, Matsumoto & Wägele, 2011. Zootaxa, 3056: 24. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).
Distribution: Vietnam (Dak Lak) (Pham et al., 2011c).

***Xanthopimpla punctata* (FABRICIUS, 1781)**

Ichneumon punctatus Fabricius, 1781. Species Insectorum, 1: 437. Holotype: ♂, India: Coromandel (ZMUC).

Xanthopimpla punctata: Krieger (1899).

Distribution: Vietnam (entire country), Afghanistan, Australia, China, India, Indonesia, Japan, Pakistan, Bangladesh, Guam, Laos, Malaysia, Mauritius, Myanmar, Nepal, Nigeria, Papua New Guinea, Russia, Sri Lanka, Singapore, Taiwan, Thailand, the Philippines and Togo (Townes & Chiu, 1970; Plant Protection Research Institute, 1976; Pham, 1997; Yu et al., 2005; Pham & Le, 2007; Pham et al., 2011c).

***Xanthopimpla quatei* TOWNES & CHIU, 1970**

Xanthopimpla quatei Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 150. Holotype: ♀, Vietnam: 30 km north of Pleiku [now in Gia Lai Province], South Vietnam (BPBM).

Distribution: Vietnam (Gia Lai), Malaysia (Townes & Chiu, 1970; Yu et al., 2005).

***Xanthopimpla regina* MORLEY, 1913**

Xanthopimpla regina Morley, 1913. Faun. British India, Hymenoptera, 3 (1): 118. Holotype: ♀, East Pakistan: Sylhet (BMNH).

Distribution: Vietnam (Bac Can, Thai Nguyen, Vinh Phuc, Phu Tho, Hoa Binh, Ninh Binh and Dak Lak), Bangladesh, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Singapore, Taiwan and Thailand (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla sexlineata* CAMERON, 1907**

Xanthopimpla sexlineata Cameron, 1907. Tijdschr. v. Ent. 50: 103. Holotype: ♂, India: Sikkim (BMNH).

Distribution: Vietnam (Kon Tum), India, Thailand (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla spicula* PHAM, BROAD, MATSUMOTO & WÄGELE, 2011**

Xanthopimpla spicula Pham, Broad, Matsumoto & Wägele, 2011. Zootaxa, 3056: 12. Holotype: ♀, Vietnam: Dak Lak Province, Ea So NR (IEBR).

Distribution: Vietnam (Dak Lak) (Pham et al., 2011c).

***Xanthopimpla trias* TOWNES & CHIU, 1970**

Xanthopimpla trias Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 242. Holotype: ♀, India: Mercara, Mysore (GPTA).

Distribution: Vietnam (Dak Lak, Vinh Phuc provinces), China, India, Nepal, Taiwan and Thailand (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla tricapus* TOWNES & CHIU, 1970**

Xanthopimpla tricapus Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 260.

Xanthopimpla tricapus impressa Townes & Chiu, 1970. Mem. Amer. Ent. Inst., 14: 260. Holotype: ♀, Myanmar: Toungoo, Karenni (ZMHB).

Distribution: Vietnam (Vinh Phuc, Nghe An, Dak Lak and Dong Nai provinces), India, Indonesia, Malaysia, Myanmar, Thailand and the Philippines (Yu et al., 2005; Pham et al., 2011c).

***Xanthopimpla varimaculata* CAMERON, 1907**

Xanthopimpla varimaculata Cameron, 1907. Tijdschr. v. Ent., 50: 103. Holotype: ♂, India: Sikkim (BMNH).

Distribution: Vietnam (Vinh Phuc, Hoa Binh, Nghe An, Ha Tinh, Thua Thien-Hue, Dak Lak, Dong Nai provinces) China, India (Yu et al., 2005; Pham et al., 2011).

The *Theronia* genus-group

Augerella Gupta, 1962

Theronia (*Augerella*) Gupta, 1962: 86. Type: *Theronia* (*Augerella*) *orientalis orientalis* Gupta; by original designation.

Augerella Gupta: Gupta (1987).

***Augerella achterbergi* PHAM, BROAD & LAMPE, 2011**

Augerella achterbergi Pham, Broad & Lampe, 2011. Zootaxa, 2745: 68. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).

Distribution: Vietnam (Dak Lak) (Pham et al., 2011a).

***Augerella vriesi* PHAM, BROAD & LAMPE, 2011**

Augerella vriesi Pham, Broad & Lampe, 2011. Zootaxa, 2745: 68. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).

Distribution: Vietnam (Dak Lak) (Pham et al., 2011a).

Nomosphesia Gupta, 1962

Theronia (*Nomosphesia*) Gupta, 1962. Pac. Ins. Mon. 4: 68. Type: *Theronia* (*Nomosphesia*) *zebroides zebroides* Krieger, by original designation.

Nomosphesia Gupta: Gupta (1987).

***Nomosphesia scutellata* (GUPTA, 1962)**

Theronia (*Nomosphesia*) *scutellata* Gupta, 1962. Pac. Ins. Mon. 4: 81.

Theronia (*Nomosphesia*) *scutellata scutellata* Gupta, 1962. Pac. Ins. Mon. 4: 82. Holotype: ♀, Singapore (USNM).

Nomosphesia scutellata scutellata: Gupta (1987).

Distribution: Vietnam (Ninh Binh, Dak Lak and Dong Nai provinces), Malaysia, Singapore and the Philippines (Gupta, 1962; Yu et al., 2005; Pham et al. 2013b).

***Nomosphesia zebroides* (KRIEGER, 1906)**

Theronia zebroides Krieger, 1906. Ztschr. Syst. Hymen. Dipt. 6: 236. Holotype: ♀, Indonesia: Sumatra (ZMHB).

Nomosphesia zebroides: Gupta (1987).

Distribution: Vietnam (Vinh Phuc, Phu Tho, Nghe An, Quang Binh, Quang Tri, Dak Lak, Dong Nai provinces), India, Indonesia, Japan, Malaysia and Taiwan (Gupta, 1962; Yu et al., 2005; Pham et al., 2013b).

Parema Gupta, 1962

Theronia (Parema) Gupta, 1962: 54. Type species: *Theronia (Parema) nigrobalteata nigrobalteata* Gupta; by original designation.

Parema Gupta: Gupta (1987).

***Parema nigrobalteata* (CAMERON, 1899)**

Theronia nigrobalteata Cameron, 1899. Mem. & Proc. Manchester Lit. Phil. Soc. 43 (3): 153. Holotype: ♀, India: Khasi Hills, Assam (OUMNH).

Theronia (Parema) nigrobalteata Cameron: Gupta (1962).

Parema nigrobalteata (Cameron): Gupta (1987).

Distribution: Vietnam (Tuyen Quang, Phu Tho, Vinh Phuc, Bac Giang, Hoa Binh, Ninh Binh, Nghe An, Ha Tinh, Thua Thien-Hue, Quang Nam, Kon Tum, Dak Lak, Ninh Thuan, Dong Nai provinces), India, Indonesia, Malaysia, Myanmar, Singapore, Thailand and the Philippines (Gupta, 1962; Yu et al., 2005; Pham et al., 2013b).

Theronia Holmgren, 1859

Theronia Holmgren, 1859. Öfvers. Svenska Vetensk. Akad. Förh. 16: 123. Type-species: *Pimpla flavicans* Fabricius = *atalantae* Poda, by monotypy.

***Theronia clathrata* KRIEGER, 1899**

Theronia clathrata Krieger, 1899. Naturf. Gesell. Leipzig, Sitzber. 1897/98: 111. Holotype: ♀: India: Khasi Hills, Assam (ZMHB).

Theronis clathrata malayensis Gupta, 1962. Pac. Ins. Mon. 4: 50. Holotype: ♀: Malaysia Peninsula: Fraser's Hill, Pahang (BMNH).

Distribution: Vietnam (Ha Tinh, Dak Lak provinces), China, India, Indonesia, Malaysia, Sri Lanka, Taiwan and the Philippines (Gupta, 1962; Yu et al., 2005; Pham et al. 2013b).

***Theronia ferruginaterra* Pham, Broad & Wägele, 2013**

Theronia ferruginaterra Pham, Broad & Wägele, 2013. Journal of Natural History, 47 (23-24): 1525. Holotype: ♀, Vietnam: Kon Tum, Chu Mom Ray NP (RMNH).

Distribution: Vietnam (Hoa Binh, Thua Thien-Hue, Dak Lak) (Pham et al., 2013b).

***Theronia longihastata* PHAM, BROAD & WÄGELE, 2013**

Theronia longihastata Pham, Broad & Wägele, 2013. Journal of Natural History, 47 (23-24): 1528. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).

Distribution: Vietnam (Dak Lak) (Pham et al., 2013b).

***Theronia tahuythinhi* PHAM, BROAD & WÄGELE, 2013**

Theronia tahuythinhi Pham, Broad & Wägele, 2013. Journal of Natural History, 47 (23-24): 1532. Holotype: ♀, Vietnam: Dak Lak, Chu Yang Sin NP (RMNH).

Distribution: Vietnam (Dak Lak) (Pham et al., 2013b).

***Theronia zebra* (VOLLENHOVEN, 1879)**

Pimpla zebra Vollenhoven, 1879. Stett. Ent. Ztg. 40: 147. Holotype: ♀, Indonesia: Java, Ambarawa (RMNH).

Theronia zebra irididennis Cameron, 1907. Tijdschr. Ent. 50: 99. Holotype: ♂, India: Sikkim (BMNH).

Distribution: Vietnam (Cao Bang, Son La, Hanoi, Vinh Phuc, Phu Tho, Hoa Binh, Nghe An, Ha Tinh, Thua Thien-Hue, Gia Lai), Brunei, China, India, Indonesia, Malaysia, Myanmar, Singapore, Sri Lanka, Taiwan, Thailand and the Philippines (Gupta, 1962; Yu et al., 2005; Pham et al., 2013b).

4. Discussion

Although the Central Highlands is recognized as a biodiversity hotspot of Vietnam with a high level of local endemism (Sterling et al., 2006), the fauna and flora of this region are seriously threatened by anthropogenic hazards such as habitat destruction (e.g., mining activities, forest burning, conversion of forest land into industrial plantation and agricultural field, timber logging, dam construction), illegal poaching and water pollution (see Fig. 2). A long-term strategy for biodiversity conservation of the Central Highlands is urgently needed, particularly in protected areas.



Figure 2. Human impacts (forest fire and rubber plantation) in Gia Lai Province, Vietnam (Photographs by T.V. Hoang)

5. References

- [1] Gauld, I.D. & Dubois, J. (2006) Phylogeny of the *Polysphincta* group of genera (Hymenoptera: Ichneumonidae; Pimplinae): a taxonomic revision of spider ectoparasitoids. *Systematic Entomology*, 31: 529-564.
- [2] Gauld, I.D., Wahl, D.B. & Broad, G.R. (2002) The suprageneric groups of the Pimplinae (Hymenoptera: Ichneumonidae): a cladistic re-evaluation and evolutionary biological study. *Zoological Journal of the Linnean Society*, 136: 421-485.
- [3] Gupta, V. K. (1962) Taxonomy, zoogeography, and evolution of Indo-Australian *Theronia* (Hymenoptera: Ichneumonidae). *Pacific Insects Monograph*, 4: 1-142.
- [4] Palacio, E., Sääksjärvi, I. & Vahtera, V. (2007) *Lamnatibia*, a new genus of the *Polysphincta* group of genera from Colombia (Hymenoptera: Ichneumonidae; Pimplinae). *Zootaxa*, 1431: 55-63.
- [5] Pham, N.T. (2013). Taxonomy and distributional pattern of Pimplinae (Hymenoptera: Ichneumonidae) from Vietnam. PhD dissertation, 287 pp.
- [6] Pham, N.T. & Khuat, L.D. (2008) A species of *Xanthopimpla* de Saussure, 1892 (Hymenoptera: Ichneumonidae) newly recorded for the ichneumonid fauna of Vietnam. *Proceedings of the 6th Vietnam National Conference on Entomology*. Agricultural Publishing House, Hanoi: 234-237 (in Vietnamese).
- [7] Pham, N.T. & Le, X.H. (2007) Species composition of the genus *Xanthopimpla* de Saussure, 1892 (Hymenoptera, Ichneumonidae, Pimplinae, Pimplini) in the Pu Mat National Park, Nghe An Province. *Journal of Biology*, 29(1): 14-19 (in Vietnamese).
- [8] Pham, N.T., Broad, G.R., Dang, H.T. & Böhme, W. (2013a). A review of the genus *Pimpla* Fabricius, 1804 (Hymenoptera: Ichneumonidae: Pimplinae) from Vietnam with description of two new species. *Organisms Diversity & Evolution*, 13(3): 397-407.
- [9] Pham, N.T., Broad, G.R. & Lampe, K.-H. (2010) Descriptions of two new species of *Augerella* Gupta (Hymenoptera: Ichneumonidae: Pimplinae) and the first record of *A. orientalis* (Gupta) from Vietnam. *Zootaxa*, 2654: 17-29.
- [10] Pham, N.T., Broad G.R. & Lampe, K.-H. (2011a) Descriptions of two new species of *Augerella* Gupta (Hymenoptera: Ichneumonidae: Pimplinae) from Vietnam. *Zootaxa*, 2745: 68.
- [11] Pham, N.T., Broad, G.R., Matsumoto, R. & Böhme, W. (2012a) First record of the genus *Acrodactyla* Haliday (Hymenoptera: Ichneumonidae: Pimplinae) from Vietnam, with descriptions of six new species. *Zootaxa*, 3207: 40-53.
- [12] Pham, N.T., Broad G.R., Matsumoto R. & Wägele W.J. (2011b) Two new species of the genus *Chablisea* Gauld et Dubois (Hymenoptera: Ichneumonidae: Pimplinae) from Vietnam. *Biologia* 66 (6): 1134-1139.
- [13] Pham, N.T., Broad G.R., Matsumoto R. & Wägele W.J. (2011c) Revision of the genus *Xanthopimpla* Saussure (Hymenoptera: Ichneumonidae: Pimplinae) in Vietnam, with descriptions of fourteen new species. *Zootaxa*, 3056: 67 pp.
- [14] Pham, N.T., Broad G.R. & Wägele, W.J. (2011d) The genus *Acropimpla* Townes (Hymenoptera: Ichneumonidae: Pimplinae) in Vietnam, with descriptions of three new species. *Zootaxa*, 2921: 1-12.
- [15] Pham, N.T., Broad, G.R., Wägele, W.J. (2012c) A review of the genus *Camptotypus* Kriechbeumer (Hymenoptera, Ichneumonidae, Pimplinae) in Vietnam with description of a new species. *Deutsche Entomologische Zeitschrift*, 59(1): 129-137.
- [16] Pham, N.T., Broad, G.R., Wägele, W.J. (2013b). A review of the *Theronia* genus-group (Hymenoptera: Ichneumonidae: Pimplinae) from Vietnam with descriptions of five new species. *Journal of Natural History*, 47(23-24): 1501-1538.
- [17] Pham, N.T., Broad, G.R., Wägele, W.J. (2013c). First record of the genus *Zaglyptus* Foerster (Hymenoptera: Ichneumonidae: Pimplinae) from Vietnam, with description of one new species. *Zootaxa*, 3702(5): 483-492.
- [18] Pham, N.T., Khuat, L.D. & Dang, H.T. (2011e) New records of Pimplinae (Hymenoptera: Ichneumonidae) from Vietnam. *Proceedings of the 7th Vietnam National Conference on Entomology*. Agricultural Publishing House, Hanoi: 210-217.
- [19] Plant Protection Research Institute (1976) Results of investigation of insects, period 1967-1968 in Vietnam. Agricultural Publishing House, Hanoi: 1-579 pp (in Vietnamese).
- [20] Sterling, E.J., Hurley, M.M. & Le, D.M. (2006) Vietnam: A Natural History. Yale University Press, New Haven and London: 423 pp.
- [21] Townes, H.K. & Chiu, S.C. (1970) The Indo-Australian species of *Xanthopimpla* (Ichneumonidae). *Memoirs of the American Entomological Institute*, 14: 1-372.
- [22] Yu, D.S., van Achterberg, K. & Horstmann, K. (2005) World Ichneumonidea 2004 - Taxonomy, Biology, Morphology and Distribution. DVD/CD. Taxapad, Vancouver, Canada.